

Pengo/SegaSOLDER SIDEPARTS SIDE

GND	A	1	GND
GND	B	2	GND
+5	C	3	+5
+5	D	4	+5
+5	E	5	+5
PUSH	F	6	METER 2
(2P PUSH)	H	7	METER 1
COIN A	J	8	COIN B
TEST	K	9	SERVICE
1P START	L	10	2P START
LEFT	M	11	RIGHT
UP	N	12	(2P UP)
(2P LEFT)	P	13	(2P RIGHT)
	R	14	DOWN
(GND)	S	15	VIDEO GND
RED	T	16	GREEN
BLUE	U	17	SYNC
(2P DOWN)	V	18	SPKR+
+12	W	19	+12
[* for remote volume pot]	X	20	[* for remote volume pot]
(GND)	Y	21	GND
GND	Z	22	(SPKR-) GND

* USE JOYSTICK TO MOVE PENGU
AROUND THE ICEFIELD.

* USE BUTTON FOR PENGU TO
KICK ICE BLOCKS AND SQUASH SNO-BEES.

* USE BUTTON FOR PENGU TO CRUSH
AN ICE BLOCK THAT IS TRAPPED.

* SNO-BEES CAN STING PENGU
AND SHOULD BE AVOIDED.

* FLASHING ICE BLOCKS
CONTAIN SNO-BEE EGGS.
TO EARN EXTRA POINTS,
CRUSH THESE ICE BLOCKS
BEFORE SNO-BEES HATCH.

* PENGU CAN KICK A WALL TO FREEZE
ANY SNO-BEES ALONG THAT WALL.

TO EARN EXTRA POINTS,
PENGU CAN RUN OVER SNO-BEES
WHILE THEY ARE STILL FROZEN.

* EARN 10,000 BONUS POINTS
BY LINING UP THREE DIAMOND BLOCKS
WITHIN THE PLAYFIELD.

* EARN ONLY 5,000 BONUS POINTS
IF A WALL IS USED TO LINE UP
THE THREE DIAMOND BLOCKS.

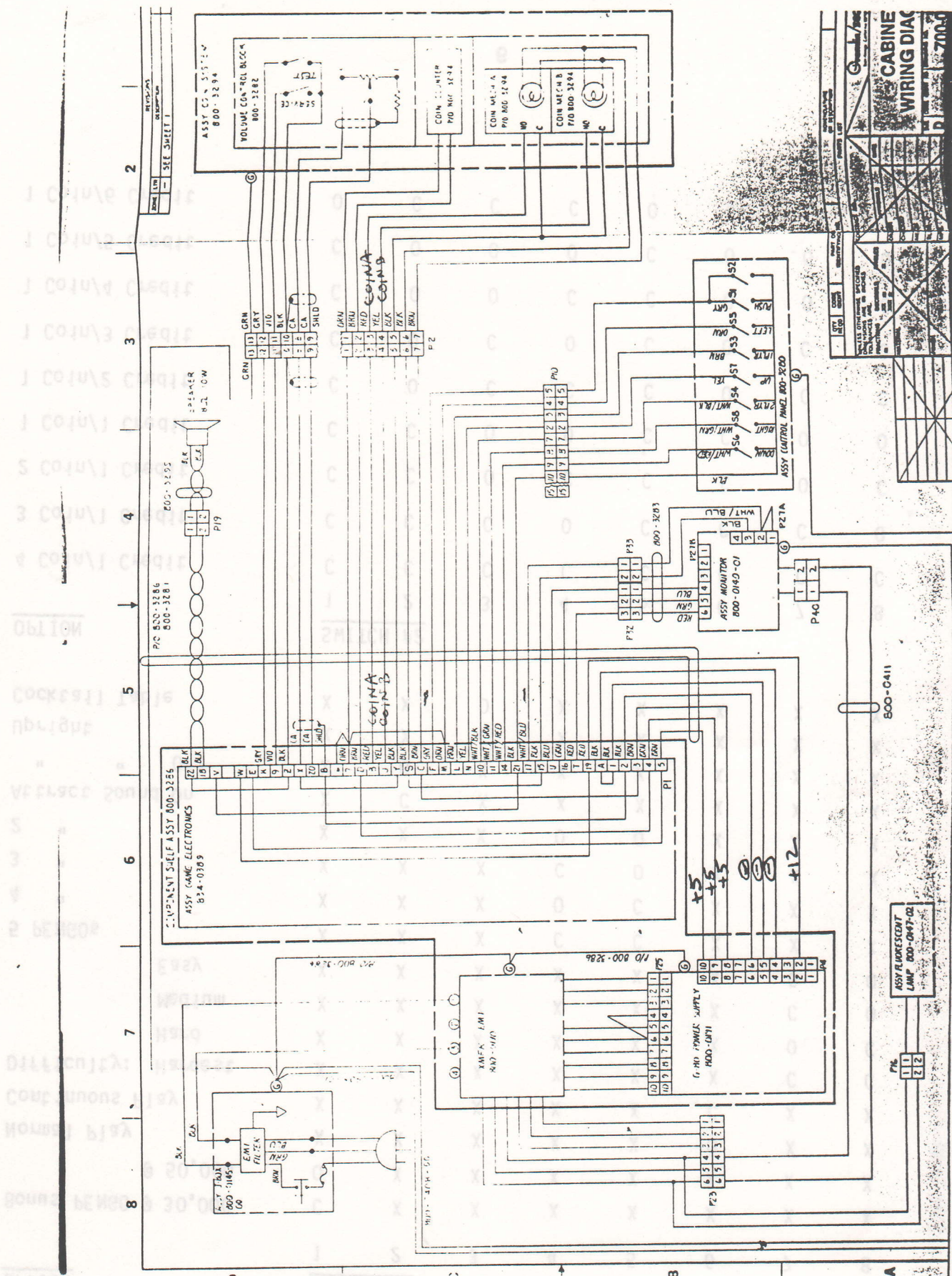
* CLEAR THE PLAYFIELD OF ALL SNO-BEES
AS QUICKLY AS POSSIBLE
TO EARN EVEN MORE BONUS POINTS.

Pengo

OPTION SELECTION

OPTION	SWITCH #1							
	1	2	3	4	5	6	7	8
Bonus PENG0 @ 30,000	C	X	X	X	X	X	X	X
@ 50,000	0	X	X	X	X	X	X	X
Normal Play	X	X	X	X	X	0	X	X
Continuous Play	X	X	X	X	X	C	X	X
Difficulty: Hardest	X	X	X	X	X	X	C	C
Hard	X	X	X	X	X	X	0	C
Medium	X	X	X	X	X	X	C	0
Easy	X	X	X	X	X	X	0	0
5 PENG0s	X	X	X	C	C	X	X	X
4 "	X	X	X	0	C	X	X	X
3 "	X	X	X	C	0	X	X	X
2 "	X	X	X	0	0	X	X	X
Attract Sound On	X	C	X	X	X	X	X	X
" " Off	X	0	X	X	X	X	X	X
Upright	X	X	C	X	X	X	X	X
Cocktail Table	X	X	0	X	X	X	X	X

OPTION	SWITCH #2							
	1	2	3	4	5	6	7	8
4 Coin/1 Credit	C	C	C	C	C	C	C	C
3 Coin/1 Credit	C	C	C	0	C	C	C	0
2 Coin/1 Credit	C	C	0	C	C	C	0	C
1 Coin/1 Credit	C	C	0	0	C	C	0	0
1 Coin/2 Credit	C	0	C	C	C	0	C	C
1 Coin/3 Credit	C	0	C	0	C	0	C	0
1 Coin/4 Credit	C	0	0	C	C	0	0	C
1 Coin/5 Credit	C	0	0	0	C	0	0	0
1 Coin/6 Credit	0	C	C	C	0	C	C	C



Penzo

SELF-TEST

OPTION SELECTION (cont.)

OPTION

SWITCH #2

2 Coin/1 Credit

1	2	3	4	5	6	7	8
0	C	C	0	0	C	C	0

4 Coin/2 Credit

5 Coin/3 Credit

6 Coin/4 Credit

2 Coin/1 Credit

1	2	3	4	5	6	7	8
0	C	0	C	0	C	0	C

4 Coin/3 Credit

OPTION

SWITCH #2

1 Coin/1 Credit

1	2	3	4	5	6	7	8
0	C	0	0	0	C	0	0

2 Coin/2 Credit

3 Coin/3 Credit

4 Coin/4 Credit

5 Coin/6 Credit

1 Coin/1 Credit

1	2	3	4	5	6	7	8
0	0	C	C	0	0	C	C

2 Coin/2 Credit

3 Coin/3 Credit

4 Coin/5 Credit

1 Coin/1 Credit

1	2	3	4	5	6	7	8
0	0	C	0	0	0	C	0

2 Coin/3 Credit

1 Coin/2 Credit

1	2	3	4	5	6	7	8
0	0	0	C	0	0	0	C

2 Coin/4 Credit

3 Coin/6 Credit

4 Coin/8 Credit

5 Coin/11 Credit

1 Coin/2 Credit

1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0

2 Coin/4 Credit

3 Coin/6 Credit

4 Coin/9 Credit

0 = Open

C = Closed

X = Not Used

SELF-TEST

The primary function of the self-test diagnostics are to verify proper operation of the game board, monitor color adjustments and to facilitate isolation of failures. Initialization is by the Self-Test Switch mounted on the Volume Control Block, just inside of the coin door at the front of the cabinet. Each test will run approximately 40 seconds unless interrupted by the One Player Start Button. Sequencing is as follows:

1. Video RAM Check (RAM 1)

Work RAM Check (RAM 2)

- Error outputs are displayed in red.

2. EPROM Check (3 EPROMs total)

- As above, error outputs are displayed in red.

3. Player Input Check

- Press One Player Start Button twice to proceed to the next test.

PLAYER CONTROLS

1P	2P
UP	OFF
DOWN	OFF
LEFT	OFF
RIGHT	OFF
SHOOT	OFF

4. Color Pattern Test

- Displays four colors: red, green, blue, and white.
For use in color purity adjustments.

5. DIP Switch Settings

- Press the 1 P Start Button or wait approximately 40 seconds to proceed to the next test.

DIP SWITCHES

1 2 3 4 5 6 7 8

SW 1 0 0 0 0 0 0 0 0

SW 2 0 0 0 0 0 0 0 0

6. Coin Switch Test

- This test checks the timing of the coin switch. Coin mech 1 will appear as A, and coin mech 2 as B. Either letter appearing within the BAD area indicates switch mis-timing. Adjust a faulty coin switch by bending the trip wire up or down, slightly.

TROUBLESHOOTING TIPS

The logic board edge connector pins are identified by numbers on the component side of the board, and letters on the opposite of the board.

To aid in the isolation of problems on the PENGOTM Logic Board, the following table lists typical symptomatic indication as to specific EPROM failure:

<u>EPROM</u>	<u>SYMPTOM</u>
1738	Display freezes
1739	Program resets indicating 60 credits at game start, display goes "mosaic"
1740	Coin meter runs continuously, player start & bonus displays pulse.
1741	Reset line pulses HI & LO, display is scrambled.
1742	In the ATTRACT mode, once characters enter the field the game resets.
1743	Program resets following 1st round.
1744	No effect on display.
1745	Sound off, continuous tone.
1640	White screen, characters block shpaed.
1695	No effect on display.

Failure in the following ICs generally result in these indications:

IC51	No sound.
IC70	No sound.
IC78	An all green screen.
IC88	Random color patterns.
IC96	Random object patterns.

Reset problems can usually be isolated to ICs 23,27 & 28. Normally at program reset:

IC23 pin - 2 is a square wave pulse.

IC23 pin - 15 is LO.

IC27 pin - 15 is HI.

A loss of 5VDC can be quickly spotted by the red LED being off.

Lines across the screen (such as experienced by RAM failure) may be traced to loss of CH1 or CH2 signals originating from IC 104.

Tables on the following pages should help to further isolate problems: